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PTO/SB/21 (08-03)

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**TRANSMITTAL  
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Total Number of Pages in This Submission

13

Application Number

09/804,522

Filing Date

March 12, 2001

First Named Inventor

Paul E. Johnson

Art Unit

2875

Examiner Name

Lavarias, A.

Attorney Docket Number

W02.101

**ENCLOSURES (Check all that apply)**☐ Fee Transmittal Form☐ Fee Attached☐ Amendment/Reply☐ After Final☐ Affidavits/declaration(s)☐ Extension of Time Request☐ Express Abandonment Request☐ Information Disclosure Statement☐ Certified Copy of Priority Document(s)☐ Response to Missing Parts/  
Incomplete Application☐ Response to Missing Parts  
under 37 CFR 1.52 or 1.53☐ Drawing(s)☐ Licensing-related Papers☐ Petition☐ Petition to Convert to a  
Provisional Application☐ Power of Attorney, Revocation☐ Change of Correspondence Address☐ Terminal Disclaimer☐ Request for Refund☐ CD, Number of CD(s) \_\_\_\_\_☐ After Allowance communication  
to Technology Center (TC)☐ Appeal Communication to Board  
of Appeals and Interferences  
☒ Appeal Communication to TC  
(Appeal Notice, Brief, Reply Brief)☐ Proprietary Information☐ Status Letter☐ Other Enclosure(s) (please  
Identify below):

Remarks

Appeal Brief attached. Appeal number not yet assigned.

**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT**Firm  
or  
Individual name

Jennifer L. Bales

Reg. No.: 38,070

Signature

Date

October 24, 2003

**CERTIFICATE OF TRANSMISSION/MAILING**

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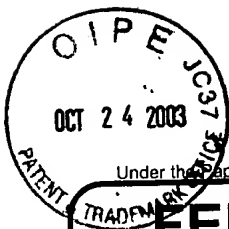
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Date

October 24, 2003

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10-27-03

AF 2875/9

PTO/SB/17/(10-03)

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# FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT

(\$) 165.00

**Complete if Known**

Application Number	09/804,522
Filing Date	March 12, 2001
First Named Inventor	Paul E. Johnson
Examiner Name	Lavarias, A.
Art Unit	2875 ✓
Attorney Docket No.	W02.101

**METHOD OF PAYMENT (check all that apply)**☐ Check ☒ Credit card ☐ Money Order ☐ Other ☐ None☒ Deposit Account:Deposit  
Account  
Number  
Deposit  
Account  
Name

02-0725

Jennifer L. Bales

The Director is authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☒ Credit any overpayments☒ Charge any additional fee(s) or any underpayment of fee(s)☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.**FEE CALCULATION****1. BASIC FILING FEE**

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1001 770	2001 385	Utility filing fee	
1002 340	2002 170	Design filing fee	
1003 530	2003 265	Plant filing fee	
1004 770	2004 385	Reissue filing fee	
1005 160	2005 80	Provisional filing fee	
<b>SUBTOTAL (1)</b>			<b>(\$) 0.00</b>

**2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE**

	Extra Claims	Fee from below	Fee Paid
Total Claims	-20** =	X	
Independent Claims	-3** =	X	
Multiple Dependent			

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description
1202 18	2202 9	Claims in excess of 20
1201 86	2201 43	Independent claims in excess of 3
1203 290	2203 145	Multiple dependent claim, if not paid
1204 86	2204 43	** Reissue independent claims over original patent
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent

**SUBTOTAL (2)** (\$) 0.00

\*\*or number previously paid, if greater; For Reissues, see above

**FEE CALCULATION (continued)****3. ADDITIONAL FEES**

Large Entity Small Entity

Fee Code (\$)	Fee Code (\$)	Fee Description	Fee Paid
1051 130	2051 65	Surcharge - late filing fee or oath	
1052 50	2052 25	Surcharge - late provisional filing fee or cover sheet	
1053 130	1053 130	Non-English specification	
1812 2,520	1812 2,520	For filing a request for ex parte reexamination	
1804 920*	1804 920*	Requesting publication of SIR prior to Examiner action	
1805 1,840*	1805 1,840*	Requesting publication of SIR after Examiner action	
1251 110	2251 55	Extension for reply within first month	
1252 420	2252 210	Extension for reply within second month	
1253 950	2253 475	Extension for reply within third month	
1254 1,480	2254 740	Extension for reply within fourth month	
1255 2,010	2255 1,005	Extension for reply within fifth month	
1401 330	2401 165	Notice of Appeal	
1402 330	2402 165	Filing a brief in support of an appeal	165.00
1403 290	2403 145	Request for oral hearing	
1451 1,510	1451 1,510	Petition to institute a public use proceeding	
1452 110	2452 55	Petition to revive - unavoidable	
1453 1,330	2453 665	Petition to revive - unintentional	
1501 1,330	2501 665	Utility issue fee (or reissue)	
1502 480	2502 240	Design issue fee	
1503 640	2503 320	Plant issue fee	
1460 130	1460 130	Petitions to the Commissioner	
1807 50	1807 50	Processing fee under 37 CFR 1.17(q)	
1806 180	1806 180	Submission of Information Disclosure Stmt	
8021 40	8021 40	Recording each patent assignment per property (times number of properties)	
1809 770	2809 385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810 770	2810 385	For each additional invention to be examined (37 CFR 1.129(b))	
1801 770	2801 385	Request for Continued Examination (RCE)	
1802 900	1802 900	Request for expedited examination of a design application	

Other fee (specify)

\*Reduced by Basic Filing Fee Paid

**SUBTOTAL (3)** (\$) 165.00**SUBMITTED BY**

Name (Print/Type)	Jennifer L. Bales	Registration No. (Attorney/Agent)	38,070	Telephone	303-664-4734
Signature		Date	October 24, 2003		

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**In the United States Patent and Trademark Office**  
**Before the Board of Patent Appeals and Interferences**

Applicant:	Paul E. Johnson	)	On Appeal to the
Serial No.:	09/804,522	)	Board of Appeals
Filed:	March 12, 2001	)	Appeal No. Not yet assigned
For:	LED Illuminated Particle	)	Examiner: A. Lavarias
	Detection Apparatus and	)	Group: 2872
	Methods	)	Date: October 24, 2003

**Brief on Appeal**

Honorable Commissioner of Patents

Washington, D.C. 20231

Sir:

This is an appeal from the Final Rejection, dated August 7, 2003 for the above identified patent application. This Brief supports the Notice of Appeal filed on August 25, 2003.

**(1) Real Party in Interest**

The real party of interest in the above-identified patent application is the University of Wyoming.

**(2) Related Appeals and Interferences**

There are no related appeals or interferences.

**(3) Status of Claims**

The claims on appeal are originally-filed claims 1-20, as shown in Appendix A. Claims 1, 2, 6-8, and 13 stand finally rejected under 35 U.S.C. § 102(e). Claims 3-5, 9-12, and 14-20 stand finally rejected under 35 U.S.C. § 103(a).

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#### **(4) Status of Amendments**

One Amendment to the specification was filed December 24, 2002 and was entered by the Examiner. The claims have not been amended.

#### **(5) Summary of the Invention**

Flow Cytometry requires an illumination source to illuminate particles in the flow, so that the illuminated particles absorb, fluoresce or scatter light sufficiently to be detected by a photodetector. See page 2, lines 2-20 of the present patent application. In the past, the illumination source has comprised a gas laser or laser diode, but never an LED, because flow cytometry requires concentrated light in a small imaging area.

It has now been discovered that an LED (202a, 202b in Figure 2) may be used as the illumination source in a flow cytometer, so long as nearly all of the light from the LED is collected and concentrated at a selected volume in the sample flow stream (303 in Figure 3). It is necessary to use a highly converging element, such as a ball lens (204), placed very close to the LED light source (close enough to require removal of the LED lens, if any, see element 202a), to collect nearly all the light, because LEDs are highly diffuse light sources. A second lens (206) then focusses the light to a tight beam within the flow sample. See Page 4, lines 1-5 and Page 5, lines 8-16.

#### **(6) Issues**

(1) Are claims 1, 2, 6, 7, 8, and 13 anticipated under 35 U.S.C. §102(e) by Maekawa et al. 5,644,388?

(2) Are claims 3-5, 9-12, and 14-20 unpatentable under 35 USC §103(a) over Maekawa et al. in view of Martin et al., U.S. Pat. No. 4,573,796 or Ross et al., U.S. Pat. No. 5,877,863?

#### **(7) Grouping of Claims**

Group 1: Claims 1, 2, 6-8, and 13 stand finally rejected under 35 U.S.C. § 102(e). These claims stand or fall together.

Group 2: Claims 3-5, 9-12, and 14-20 stand finally rejected under 35 U.S.C. § 103(a). These claims are dependant upon Group 1 claims, and hence stand if Group 1 claims stand. Otherwise, these claims stand or fall together.

## **(8) Argument**

### **Group 1 Argument:**

Claim 1 is reproduced below for discussion. The arguments presented with respect to claim 1 are applicable to the other claims in Group 1.

Claim 1. An LED illumination source device for use in a flow particle detection device comprising:

an LED for providing light at a selected wavelength; and

**an optical element for collecting nearly all of the light from the LED** and concentrating the collected light at a selected volume within a flow sample stream.

Rejection of claims under 35 U.S.C. § 102 requires that a single prior art reference disclose each and every element of the claim, either expressly or inherently. *Verdegall Brs., Inc. v. Union Oil Co.*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir.), cert. Denied, 484 U.S. 827 (1987). Anticipation requires a showing that each limitation of a claim is found in a single reference, *In re Donohue*, 766 F.2d 531, 534, 226 USPQ 619, 621 (Fed Cir. 1985), cited in *Bristol-Myers Squibb v. Ben Venue Laboratories*, 246 F.3d 1368 (Fed. Cir. 2001).

*Crown Operations Int'l., Ltd. v. Solutia Inc.*, 289 F.3d 1367 (Fed. Cir. 2002) discussed what is required for an element of a claim to be inherent:

Regarding alleged anticipation by the Gillery patent, on its face the Gillery patent does not disclose or discuss a two percent limitation for the reflectance contribution of the solar control film. Crown maintains that the '511 patent merely claims a preexisting property inherent in the structure disclosed in the prior art. Crown urges us to accept the proposition that if a prior art reference discloses the same structure as claimed by a patent, the resulting property, in this case, two percent solar control film reflectance, should be assumed. We decline to adopt this approach because this proposition is not in accordance with our cases on inherency. If the two percent reflectance limitation is inherently disclosed by the Gillery patent, it must be necessarily present and a person of ordinary skill in the art would recognize its presence. *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950?51 (Fed. Cir. 1999); *Continental Can*, 948 F.2d at 1268, 20 USPQ2d at 1749. Inherency "may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Id.* at 1269, 20 USPQ2d at 1749

(quoting In re Oelrich , 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981)). (Emphasis added)

(quoted from online repository at Georgetown University, URL <http://www.ll.georgetown.edu/federal/judicial/fed/opinions/01opinions/01-1144.html>)

The single reference cited (U.S. Pat No. 5,644,388 to Maekawa et al) by the Examiner does not show, teach or suggest every element of the rejected claims, directly or inherently. Specifically it does not show “an optical element for collecting nearly all of the light from the LED. . .” as is specified in each independent claim.

Appendix B (found in the record in Office Communication of August 27, 2003) shows why this is so. LEDs are highly divergent and uncollimated. In order to collect a majority of the light from an LED, it is necessary to use highly converging optics very close to the LED light source. The embodiment shown in Figures 2 and 3 of the present application uses a highly converging ball lens (204), placed very close to the LED light source (close enough to require removal of the LED lens, if any, see element 202a), and a second lens (206) that focusses the light to a tight beam within the flow sample. See Page 4, lines 1-5 and Page 5, lines 8-16.

The Examiner argues, in the Office Action of August 7, 2003 (paragraph 2 in Response to Arguments), that “any amount of incident light collected by an optical element may be construed as collecting nearly all of the incident light by the optical element.” However, the claims do not specify “an optical element for collecting nearly all of the light **incident upon said optical element**” but rather “an optical element for collecting nearly all of the light **from the LED.**” It is true that a conventional lens, spaced apart from a diverging light source, will collect nearly all of the light incident upon it. It will not, however, collect nearly all of the light from the light source unless the light from the light source is collimated.

Maekawa et al uses an LED (ref. no. 16) as a triggering device for the actual illumination source, a pulse laser (ref. no. 3). This embodiment is found in Figure 5 of Maekawa et al. Figure 9 uses a CW triggering device (ref. no. 29) which might be an LED, though this is not stated. LED 16 in Figure 5 does not include any focussing optics at all. CW source 29 includes a conventional lens 30, spaced apart from the CW source 29. If CW source is an LED, it apparently does not have its front transparent dome removed. Neither the embodiment of Figure 5 nor the embodiment of Figure 9 include a highly converging optical element adjacent to the light source, or any analogous structure.

Hence, there is no structure shown to collect nearly all of the light from an LED in Maekawa et al. To paraphrase Crown Operations above, '[i]f the [relevant] limitation is inherently disclosed by the [cited reference], it must be necessarily present and a person of ordinary skill in the art would recognize its presence.' Further, '[i]nherency "may not be established by probabilities or possibilities. . . ."' Therefore, the fact that Maekawa et al does not show, teach, or suggest structure to collect nearly all of the light from an LED renders the 35 U.S.C. § 102 claim rejections improper.

#### Group 2 Argument:

Karsten Mfg. Corp. v. Cleveland Golf Co. 242 F.3d 1376; 58 U.S.P.Q.2D 1286 (2001) reiterated the standards for combining references in order to reject claims as obvious under 35 U.S.C. § 103:

In holding an invention obvious in view of a combination of references, there must be some suggestion, motivation, or teaching in the prior art that would have led a person of ordinary skill in the art to select the references and combine them in the way that would produce the claimed invention. See ,e.g., Heidelberg Druckmaschinen AG v. Hantscho Commercial Prods., Inc. , 21 F.3d 1068, 1072, 30 USPQ2d 1377, 1379 (Fed. Cir. 1994) (When the patent invention is made by combining known components to achieve a new system, the prior art must provide a suggestion, or motivation to make such a combination."); Northern Telecom v. Datapoint Corp. , 908 F.2d 931, 934, 15 USPQ2d 1321, 1323 (Fed. Cir. 1990) (It is insufficient that the prior art disclosed the components of the patented device, either separately or used in other combinations; there must be some teaching, suggestion, or incentive to make the combination made by the inventor."); Uniroyal, Inc. v. Rudkin-Wiley Corp. , 837 F.2d 1044, 1044, 1051, 5 USPQ 1434, 1438 (Fed. Cir. 1988) (same). (Emphasis added)

(Quoted from online repository at Georgetown University, URL <http://www.ll.georgetown.edu/federal/judicial/fed/opinions/99opinions/99-1234.html>)

None of the references cited by the Examiner show, teach, or suggest structure for collecting nearly all of the light from an LED separately or in combination. Nor is there any motivation to make this improvement, as none of the references consider using an LED as the illumination source in a flow cytometer. Maekawa et al uses an LED (ref. no. 16) as a monitoring light in a triggering device for the actual illumination source, or "excitation" source, a

pulse laser (ref. no. 3). This embodiment is found in Figure 5 of Maekawa et al and described in column 10, lines 11-17. Figure 9 illustrates using a CW light source (ref. no. 29) which might be an LED, as a "monitoring light" to trigger "exciting" light source 3. See Figure 9 and column 13, lines 23-26.

Since CW light elements 16 and 29 are only used as monitoring lights to trigger the exciting lights comprising pulse lasers, conventional focussing of their light is sufficient for their purpose. Only when an LED becomes the exciting light source does it become necessary to collect nearly all of the light from the LED in order to focus it within the flow in the flow cytometer.

Applicant is the first inventor to use an LED as the illuminating source in a flow cytometer. Such a use requires that nearly all of the light be collected from the LED and concentrated at a selected volume in the flow, since LEDs are not particularly bright light sources, and are highly divergent and uncollimated. See Appendix B (found in the record in Office Communication of August 27, 2003) for a photograph of a conventional LED, showing the dissipation of the light. Each independent claim therefore includes the limitation that nearly all of the light be collected from the LED and concentrated at a selected volume in the flow.

Hence, the present application is neither anticipated nor rendered obvious by references which neither collect nearly all of the light from the LED and concentrate it at a selected volume in the flow, nor contemplate using an LED as the illuminating source, so that there would be no reason to collect and concentrate the light in this way.

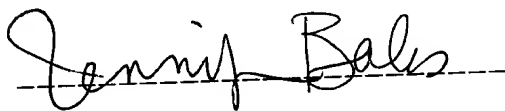
Accordingly, the reversal of the Examiner by the honorable Board of Appeals is respectfully solicited.

Respectfully submitted,

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By



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